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**Philips et al.**

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(54) **MULTI-HULL SURFACE VESSEL WITH  
DRAG REDUCTION ON LATERAL HULLS**

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(58) **Field of Search** ..... 114/61.1, 67 A,  
114/288, 289, 290, 67 R, 274; 244/207, 208

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(57) **ABSTRACT**

A marine surface vessel having a main hull and at least two lateral hulls disposed respectively on opposite sides of the main hull. The vessel includes an engine disposed in the main hull producing exhaust gas and cooling air, microbubble injectors disposed in subsurface areas of each of the lateral hulls, and conduits in fluid communication with the microbubble injectors. Upon operation of the engine, the exhaust and/or cooling air produced by the engine is directed by the conduits to the injectors to effect generation of microbubbles on the subsurface areas of the lateral hulls to occasion microbubble drag reduction on the lateral hulls.

**5 Claims, 3 Drawing Sheets**

